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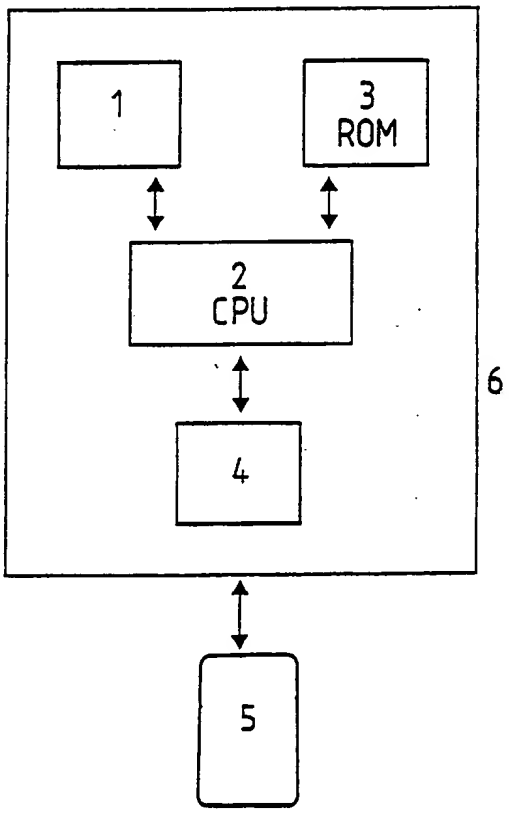
(54) Title: METHOD AND APPARATUS FOR CUSTOMIZING A DEVICE WITH A SMART CARD

(57) Abstract

New pay TV systems, e.g. the Videocrypt system, make use of smart cards (5) which control the access to a respective decoder (6) for de-scrambling the TV signal. In order to be efficient in production, decoders have to be completely identical for the manufacturer. But each program-provider would prefer specifically customized decoders. For instance, in cable networks the cable operators will use different channel allocation depending from the respective site. Currently the only solution available is that the user or more often the installer will program the decoder. This operation is fastidious and consumes a lot of time. The inventive method offers a quick and flexible solution for personalizing intelligently a pay TV decoder (6) or respective devices. In each pay TV receiver decoder (6) with an access control based on a smart card (5) there are components which are able to read any smart card responding to a predefined format. The invention uses a dedicated smart card in order to perform automatically a channel programming.



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Method and Apparatus for customizing a device with a smart card

The present invention relates to a method and to an apparatus for customizing a device with a smart card.

Background

New pay TV systems, e.g. the Videocrypt system, make use of smart cards which control the access to a respective decoder for de-scrambling the TV signal.

Invention

It is one object of the invention to disclose a method of customization a pay TV decoder. This object is reached by the inventive method disclosed in claim 1.

In principle the inventive method consists in customizing a device 6 with a smart card 5, whereby a dedicated smart card is linked to a card reader 4 of said device, and whereby said device is also provided with memory means 1, 3 and with processor unit means 2 connected to said memory means and to said card reader, and whereby said dedicated smart card 5 is provided with the following functions:

- presentation of a normalized answer to a 'reset' command;
- presentation of an application identifier to said device 6;
- procedure which transmits to said device 6 data contained in a table, said table containing different values for customization of said device 6,

and said device 6 becomes customized automatically after said dedicated smart card 5 has been inserted to said card reader

4 by transmitting data from said smart card 5 to said device 6 and storing respective data in said memory means 1.

Advantageous additional embodiments of the inventive method are resulting from the respective dependent claims.

It is a further object of the invention to disclose an apparatus which utilizes the inventive method. This object is reached by the inventive apparatus disclosed in claim 7.

In principle the inventive apparatus contains processor unit means 2 which are connected to memory means 1, 3 and to a card reader 4 in which a smart card 5 is inserted, whereby data stored in said smart card 5 are transmitted to said card reader 4 and respective data become stored in said memory means 1.

In order to be efficient in production, decoders have to be completely identical for the manufacturer. But each program provider would prefer specifically customized decoders. For instance, in cable networks the cable operators will use different channel allocation depending from the respective site. Currently the only solution available is that the user or more often the installer will programme the decoder. This operation is fastidious and consumes a lot of time.
The inventive method offers a quick and flexible solution for personalizing intelligently a pay TV decoder or respective devices. In each pay TV receiver decoder with an access control based on a smart card there are the following components:

- a non-volatile memory, typically of EEPROM type, which memorizes several parameters, especially the channels' frequencies;
- a central processor unit (CPU);
- a ROM memory containing the application software;
- a card reader which allows the CPU to read from a smart card.

Such a system is able to read any smart card responding to a predefined format. The invention uses a dedicated smart card in order to perform automatically a channel programming.

Drawing

Preferred embodiments of the invention will now be described with reference to the accompanying drawing:

Fig. 1 shows a partial block diagram of an inventive pay TV decoder together with a smart card.

Preferred embodiments

The smart card 5 in Fig. 1 contains (not depicted) a CPU, an interface and a memory with software which performs at least the following functions:

- presentation of a normalized answer to 'reset' (see ISO 7816-3);
- presentation of an application identifier to decoder 6;
- procedure which transmits to decoder 6 the data contained in a table, for instance by using a dedicated instruction class (see ISO 7816-3 section 8.2.1);
- table containing the different values for customization.

Pay TV decoder 6 contains a CPU 2, which is connected to a ROM 3, to an EEPROM memory 1 and to a card reader 4. Once the decoder 6 has identified the installer smart card, it will store the data received from smart card 5 inside memory 1. After this operation the receiver part of decoder 6 (not depicted) will be correctly programmed. This operation can be completely automatic and transparent or may be initiated by the installer.

Smart card 1 can be dedicated to one configuration. But if a card with larger memory is used it is possible to use the same smart card 1 for different configurations from the same program provider by changing a little bit the software stored in the smart card and in the decoder's program memory. If a procedure is added which allows to send to smart card 5 a reference, the card will be able to point to the corresponding table and down load the right one.

In case of cable networks it is possible to store in one card all the channel allocation tables for the different sites belonging to the program provider. Thereby the intervention of the installer is reduced and the programming of the channels is efficient.
If smart cards 5 with EEPROM memory are used, it advantageously is possible to change at any moment the configuration of the network without changing the smart cards. Another advantage is that decoder 6 does not need to know which form the allocation table will have. The cable operator may change very easily its parameters (like raster) between adjacent channels.
Obviously the installation time is reduced drastically.

Sometimes decoder 6 must be customized according to a customer configuration. If a video cassette recorder (VCR) is controlled from a pay TV decoder via an infra-red link as described in EP-A-91400989, decoder 6 must store infra-red codes for this connection to the VCR. This codes, too, can be down loaded by a dedicated smart card 5.
The installer may have a listing of all VCR types and a bunch of smart cards. If he has found the correct type, he inserts the right card and requests the right table to be downloaded.

This invention can also be used for customizing universal infra-red hand sets or other devices like TV's, VCR's or audio equipment. The remote control hand set can be programmed via an infra-red link between the pay TV decoder and itself.

The hand set or device, respectively, itself also may include a smart card reader and be programmed in a direct way. Therefore it is possible that different manufacturers use the same hand set which will be programmed by a specific smart card added from the respective manufacturer to the hand set.

The hand set may also be programmed by any other device, e.g. TV receiver, audio amplifier, which contains a respective card reader.

Instead of an infra-red link also other communication paths are possible, for instance temporary cable connections.

Claims

1. Method for customizing a device (6) with a smart card (5), whereby a dedicated smart card is linked to a card reader (4) of said device, and whereby said device is also provided with memory means (1, 3) and with processor unit means (2) connected to said memory means and to said card reader, and whereby said dedicated smart card (5) is provided with the following functions:

- presentation of a normalized answer to a 'reset' command;
- presentation of an application identifier to said device (6);
- procedure which transmits to said device (6) data contained in a table, said table containing different values for customization of said device (6),

and said device (6) becomes customized automatically after said dedicated smart card (5) has been inserted to said card reader (4) by transmitting data from said smart card (5) to said device (6) and storing respective data in said memory means (1).

2. Method according to claim 1, **characterized in** that said device (6) is a pay TV decoder or a programmable remote control hand set or a receiver which can select the frequency or channel number of a receiving channel.

3. Method according to claim 2, **characterized in** that a video cassette recorder controlled by an infra-red link to said pay TV decoder is programmed by using said smart card (5).

4. Method according to any of claims 1 to 3, **characterized in** that frequencies or channel numbers for said device

(6) are selected and/or programmed in connection with said customization.

5. Method according to any of claims 1 to 4, **characterized in** that different configurations can be selected in connection with said customization by transmitting reference data from said device (6) to said smart card (5) and transmitting respective data tables from said smart card (5) to said device (6).

6. Method according to claim 2, **characterized in** that said programmable hand set is provided with a card reader and said hand set is programmed by using said smart card (5).

7. Method according to any of claims 1 to 7, **characterized in** that said device (6) becomes customized in a menue-controlled way after said dedicated smart card (5) has been inserted to said card reader (4).

8. Apparatus for a method according to any of claims 1 to 7, containing processor unit means (2) which are connected to memory means (1, 3) and to a card reader (4) in which a smart card (5) is inserted, whereby data stored in said smart card (5) are transmitted to said card reader (4) and respective data become stored in said memory means (1).

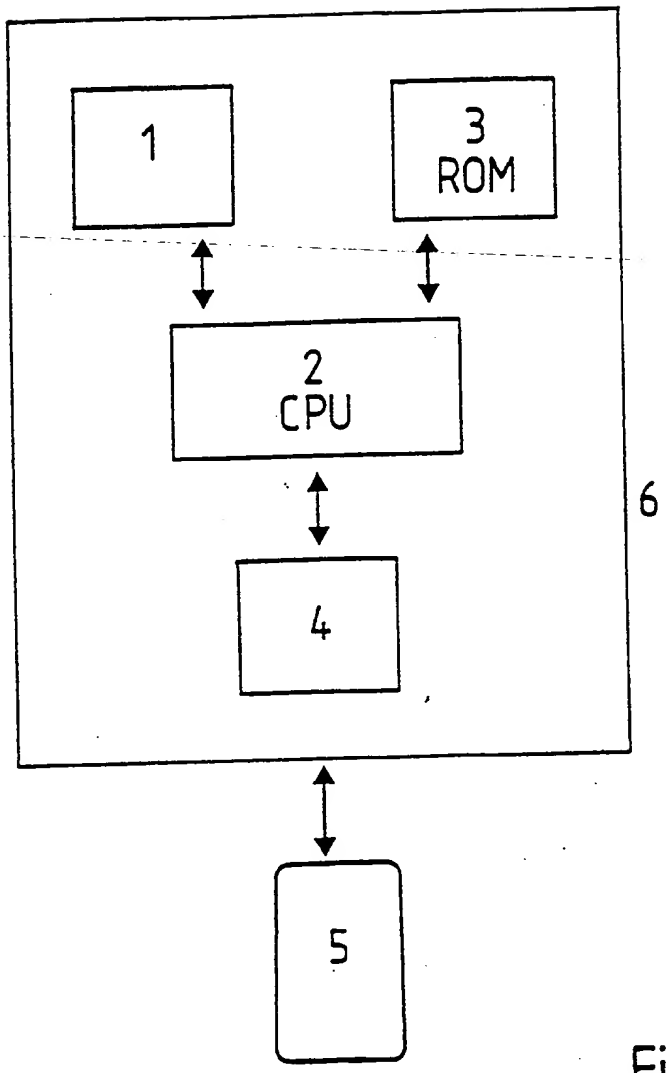

Fig.1

INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 92/02195

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 H04N7/16

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	H04N

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
A	ELEKTRONIK vol. 38, no. 6, 17 March 1989, MÜNCHEN pages 56 - 58 M.JÜNKE 'DIGITALES FERNSEHKONZEPT FÜR SATELLITEN-PAY-TV' see page 58 ---	1-8
A	5.CONFERENCE AND EXHIBITION ON TELEVISION TECHNIQUES,12-14.JUNE,1990 vol. 2, BUDAPEST,HUNGARY pages 19 - 27 J.BLINEAU 'SECOND GENERATION OF CONDITIONAL ACCESS SYSTEMS FOR TELEVISION' see page 24, line 14 - page 25, line 7 --- -/--	1-8

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
01 DECEMBER 1992	23. 12. 92
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	GREVE M.P.

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	13TH INTERNATIONAL T.V.SYMPOSIUM,28.MAY-2.JUNE,1983 MONTREUX pages 1 - 10 Q.A.HOANG 'THE MEMORY CARD - ITS POSSIBLE USE TO PAY TV SATELLITE BROADCASTING' see the whole document ---	1-8
A	EP,A,0 328 440 (SGS-THOMSON MICROELECTRONICS S.A.) 16 August 1989 see page 7, line 55 - page 8, line 56 ---	1-8
A	EP,A,0 436 472 (SOCIETA ITALIANA PER LO SVILUPPO DELL'ELETTRONICA S.I.SV.EL) 10 July 1991 see column 7, line 16 - line 22 -----	1-3

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. EP 9202195 SA 64500

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0328440	16-08-89	FR-A- 2627045	11-08-89
		JP-A- 1227527	11-09-89
EP-A-0436472	10-07-91	None	